REMARKS

Summary of Amendments to Claims

Claims 1-9 have been amended as required by the examiner to consistently use "electromagnetic energy" rather than "light". Furthermore, claim 4 has been amended to read, "second fixed electromagnetic energy source," thereby correcting the lack of antecedent basis.

Claim 1 has been further amended to include the added limitation that the interference pattern impinges the detector "without manipulating said interference pattern by additional optical elements." Express support for this addition is found in the specification on line 18 of page 8, which states "the interference pattern **101** is detected by the fixed detector." Furthermore, it is inherently clear from Figures 1-3 that no optics have been used to manipulate the interference pattern immediately prior to detection.

Claims 8, 11, and 17 have been cancelled. The subject matter of claim 11 has been incorporated into part "b" of independent claim 9 as an additional limitation. Furthermore, the quantifying phrase "at least one" has been added to emphasize the fact that the claimed invention can accommodate a plurality of reflective surfaces. Support for the use of "at least one reflective surface" is found in the specification on line 12 of page 8, which describes an embodiment that uses "*mirrors* (i.e. more than one)."

Claim 9 has also been amended to include the limitation that the detector directly measures the interference pattern "without being manipulated by additional optical elements." As in claim 1, support for this amendment is found on line 18 of page 8 in the original application. Finally, additional language has been added to emphasize the lack of optical elements in front of the detector by clarifying the location of the detector relative to the electromagnetic energy sources and the reflective surfaces. Said additional language does *not* constitute new matter, but is merely a description of the embodiments originally illustrated in Figures 1-3.

Claims 14-16 have been amended to correct informalities introduced by changes to claim 9 from which claims 14-16 depend.

New claims 18-26 have been added to claim material found in the original specification and do not constitute new matter. For example, independent claim 18 is directed to a method of Fourier Transform Spectrometry similar to the method in claim 1 except that claim 18 includes the additional limitation that the sample to be analyzed also serve as said reflective surface.

Express support for this new claim is found on page 10, lines 1-5, which states that the reflective surface "may be the material whose electromagnetic radiation interaction properties are being measured." Other examples include claim 23, which finds support on page 4, line 19 and claims 24 and 26, which find support on page 8, lines 28-30.

Rejection Under 35 USC § 102(b)

The examiner has rejected claims 1-3 as being anticipated by Smith (U.S. Patent 4,976,542). As currently amended, the applicant respectfully asserts that the examiner's rejection of claim 1 is no longer applicable and now fails to show how the Smith patent provides "each and every element of the claimed invention, arranged as in the claim," which is required for a proper case of anticipation (Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 730 F.2d 1452, 221 USPQ 481, 485 (Fed. Dir. 1984) (citing Connell v. Sears, Roebuck & Co., 722 F.2d 1542, 220 USPQ 193 (Fed. Cir. 1983).

For example, Smith discloses an imaging device "comprising *optic means to image* the field of view onto a detector (Col. 4, line 68 – italics added)." The specific embodiment described by Smith and relied upon by the examiner, discloses the use of a cylindrical mirror to focus the interference pattern prior to imaging by the charge-coupled device (CCD) detector (Col. 4, line 28).

In contrast, the instant claim contemplates *direct* measurement of the interference pattern wherein the interference pattern impinges the detector "without manipulating said interference pattern by additional optical elements." The absence of lenses and mirrors immediately prior to detection in the applicant's invention represents a clear and significant distinction over Smith's patent ('542). In fact, for a given detector with a specific pixel density, if a focusing element, such as the cylindrical mirror represented by element 54 of Fig. 2 in Smith's specification, were utilized in the applicant's invention, it would result in a loss of spatial resolution because the focused image impinging upon the detector would be smaller than the original interferogram prior to focusing. That spatial resolution would be lost is at a minimum inherent in the statement by Smith in column 4, line 24, which explains that the light is "focused." Focusing, by definition, requires the convergence of light into a smaller image, which results in a lower resolution for a given detector. More specifically, it is also expressly illustrated in Fig. 2,

wherein the light rays reflected off of element 54 converge into a *smaller* image on the detector (element 56). Directly measuring the interferogram without optical manipulation, as in the currently claimed invention, is not only a clear distinction, but is also an improvement because it eliminates the loss of spatial resolution that is present in the Smith apparatus. In short, Smith teaches away from the claimed invention.

Finally, because dependent claims 2 and 3 contain all the limitations of amended base claim 1, plus their respective additional limitations, the applicant respectfully asserts that the 102 rejection of claims 2 and 3 is also no longer applicable. The applicant's assertion is supported by *Hartness International v. Simplimatic Engineering Co.* in which the Federal Circuit held that the "dependent claim...was nonobvious (and novel) because it contained all the limitations of [the independent] claim...plus a further limitation (Hartness International v. Simplimatic Engineering Co., 819 F.2d 1100, 1108, 2 USPQ2d 1826, 1831 (Fed. Cir. 1987)."

In view of the amendments and reasons described above, the applicant requests that the examiner withdraw his 102(b) rejection of claims 1-3 and that such claims be allowed.

103 Rejection

The examiner has rejected claims 4-17 under U.S.C. 35 103(a) as being unpatentable over Smith in view of Krivoshlykov (6,016,197). However, since claims 4-8 depend from the broad claim, which has been amended to distinguish over the cited art, applicant respectfully requests that the examiner withdraw his 103(a) rejection in favor of allowance based again on the inherent allowability of dependent claims that depend from a non-obvious broad claim.

The rejection of independent claim 9 has been addressed by applicant's amendment of the original claim to include a further limitation requiring the interference pattern to *directly* impinge the detector. Specifically, claim 9 now stipulates that the interference pattern generated by the electromagnetic energy point sources should impinge the detector "*without* manipulating said interference pattern by additional optical elements."

On the other hand, in the '542 patent, these optical elements are both taught and required for the operation of Smith's apparatus and include focusing means such as lenses and/or mirrors that are positioned "where [the interference pattern] is focused onto the detector (col. 4, line 24)," immediately prior to impinging said detector.

The claimed absence of optical elements that are used to manipulate the interference

pattern prior to impinging the detector in the applicant's invention represents a limitation that renders the examiner's 103 rejection of claim 9 no longer applicable. Specifically, the Smith reference no longer teaches nor suggests all of the claim limitations as is required by MPEP §2143.03. In fact, the Smith reference actually teaches away from the applicant's invention by stating that cylindrical optics preserve "the spatial information contained in [the dimension parallel to the fringe pattern] (col. 2, line 59-60)," and are required elements to take advantage of a significant aspect of Smith's invention, namely the CCD detector's "capability of making measurements in two dimensions (col. 2, lines 50-51)." To eliminate the optical means for manipulating the interference pattern (i.e. the cylindrical lenses and mirrors) from Smith's invention is to contradict the teachings of Smith's disclosure. For this reason, not only does the Smith patent fail to teach all the limitations of the applicant's claim 9, but it also fails to provide a motivation to modify it's teachings to produce the applicant's claimed invention. In other words, any suggestion to remove the cylindrical lenses and mirrors from the Smith apparatus, which are used to focus the interference pattern onto the CCD detector, would constitute hindsight reconstruction based on the applicant's invention, which has been expressly forbidden by the Federal Circuit in *In re* Rouffet, 149 F. 3d 1350.

For the reasons described above, applicant earnestly requests that the examiner reconsider his rejection of claim 9 and subsequently allow this claim. Applicant also requests allowance of claims 10 and 13-17, as they are dependent upon claim 9, which has been shown to be distinct and non-obvious over smith and Krivoshlykov.

Finally, with regard to the obviousness of claims 5-8 and 15-17 and of the claimed use of fiber optics, which the examiner has called out in particular, the applicant asserts that the examiner's arguments are no longer applicable because "the claimed invention as a whole must be considered," as stated in the MPEP §2141.02. Regardless of whether or not Smith and/or Krivoshlykov use fiber optics, alter light by splitting said light, or use Bragg gratings, a proper 103 rejection of such claims can not rest merely on the fact that several of the total number of elements are obvious, if the invention *as a whole* is not obvious, as is currently the case. Specifically, since the applicant's claimed *absence* of means for optically manipulating the interference pattern prior to detection is novel and non-obvious, and since the combination of Smith and Krivoshlykov fail to teach all the limitations of the currently claimed invention, the examiner's 103 rejection of claims 5-10 and 13-17 is no longer applicable.

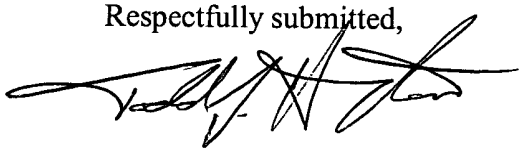
CLOSURE

For all the reasons advanced above, Applicant respectfully submits that the application is in condition for allowance and that action is earnestly solicited.

The Commissioner is hereby authorized to charge any additional fees which may be required for this amendment, or credit any overpayment, to Deposit Account 02-1275.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account 02-1275.

Respectfully submitted,



Todd J. Harrington
Reg. No. 50,137

Todd J. Harrington (K1-53)
Intellectual Property Services
Battelle Memorial Institute
Pacific Northwest Laboratories
P.O. Box 999
Richland, WA 99352
(509) 375-2981